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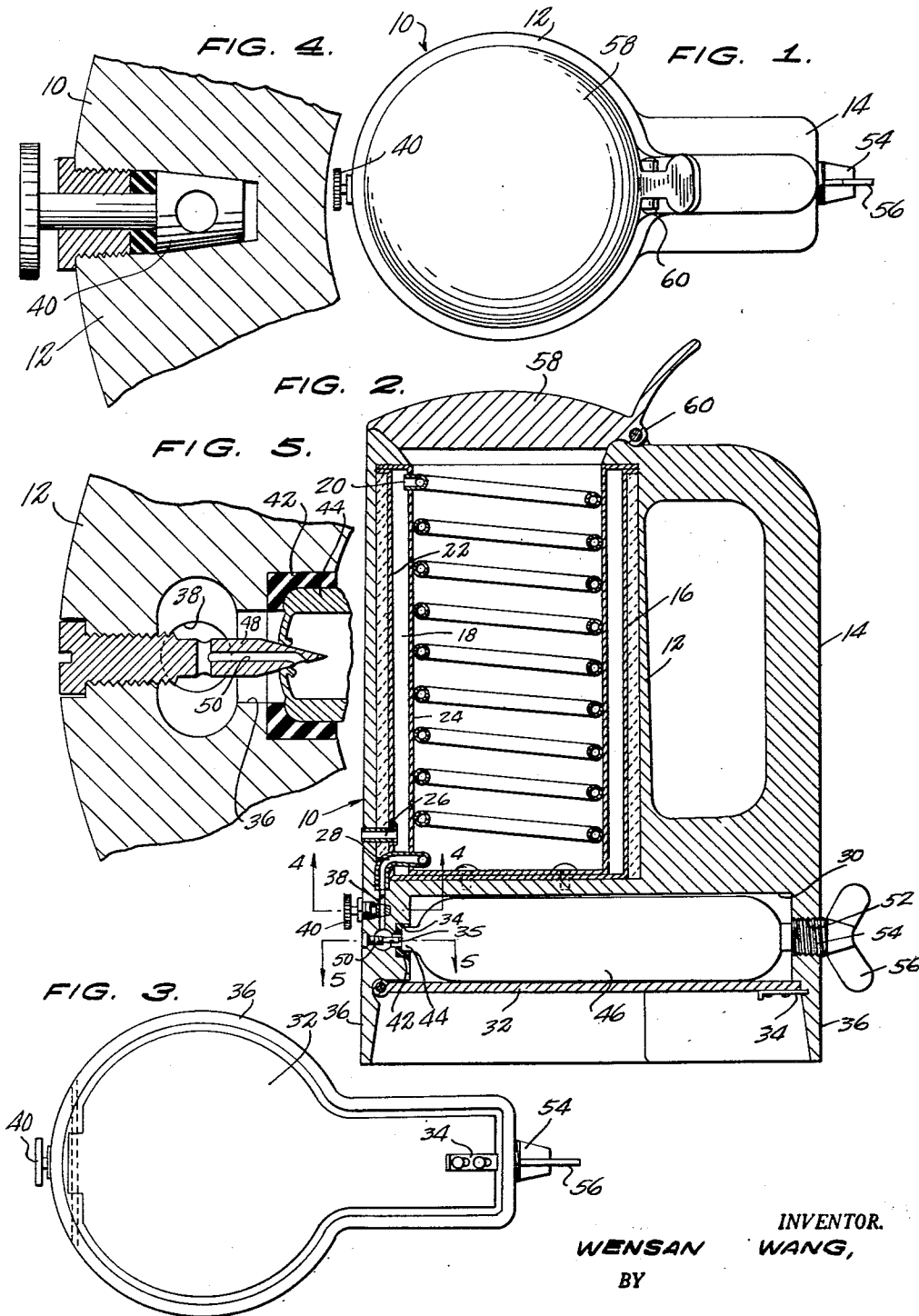
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2,805,556

POCKET LIQUID COOLING DEVICE

Filed Nov. 22, 1955

3 Sheets-Sheet 1



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FIG. 6.

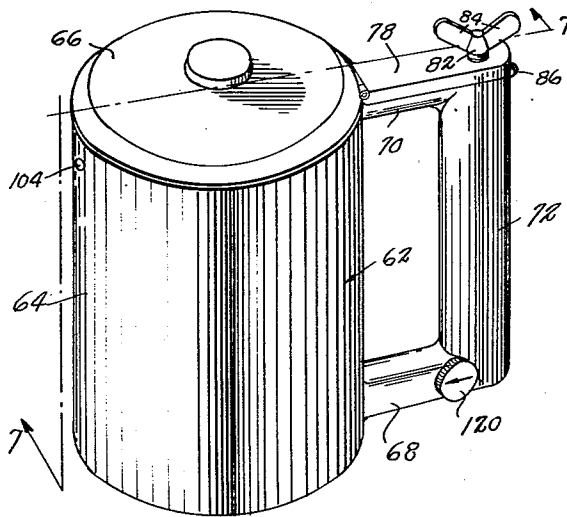
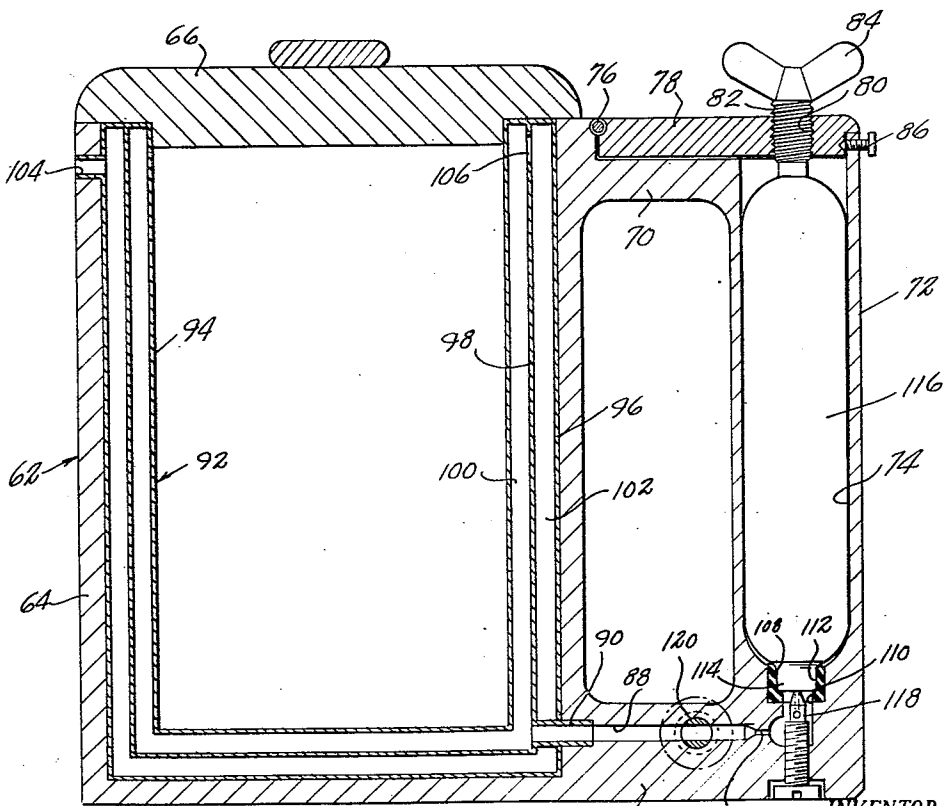


FIG. 7.



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POCKET LIQUID COOLING DEVICE

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5 Claims. (Cl. 62—92)

This invention relates to a pocket device and has for its primary object to cool liquids or like substances to render them more palatable.

Another object is to preserve the liquid or the like in a cooled condition for a relatively long period of time.

Another object of the invention is to retain the contents of a receptacle in contact with an expansion chamber and to release a refrigerating gas into the expansion chamber to cool the contents thereof.

The above and other objects may be attained by employing this invention which embodies among its features a receptacle having an open top, an expansion chamber lining the interior of the receptacle, said receptacle having a cartridge chamber which communicates with the expansion chamber, a puncturable refrigerant containing cartridge mounted in the cartridge chamber for longitudinal movement, a needle carried by the receptacle and extending into the cartridge chamber, and means for advancing the cartridge longitudinally in said cartridge chamber into contact with the needle for puncturing said cartridge and causing the contents thereof to enter the expansion chamber.

Other features include a handle carried by the receptacle and having a cartridge chamber opening thereinto through the top thereof, said handle having a duct communicating with the lower end of the expansion chamber and with the cartridge chamber adjacent its lower end, a needle mounted in the handle and extending into the cartridge chamber adjacent its junction with the duct, a puncturable refrigerant containing cartridge mounted in the cartridge chamber for advance toward the needle, and means carried by the receptacle and extending into the cartridge chamber for engaging the cartridge and advancing it toward the needle to puncture the cartridge and release the contents of the cartridge.

Other features include a valve mounted in the receptacle in intercepting relation to the duct for controlling the flow of refrigerant through said duct from the cartridge into the expansion chamber.

In the drawings:

Figure 1 is a top plan view of one form of this invention;

Figure 2 is a vertical sectional view through Figure 1;

Figure 3 is a bottom plan view of Figure 1;

Figure 4 is a fragmentary enlarged sectional view taken substantially on the line 4—4 of Figure 2;

Figure 5 is an enlarged fragmentary sectional view taken substantially along the line 5—5 of Figure 2;

Figure 6 is a perspective view of a modified form of the invention;

Figure 7 is a vertical sectional view on an enlarged scale taken substantially on the line 7—7 of Figure 6;

Figure 8 is a top plan view of a further modified form of the invention;

Figure 9 is a vertical sectional view taken substantially on the line 9—9 of Figure 8; and

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Figure 10 is a fragmentary enlarged detail sectional view taken substantially on the line 10—10 of Figure 9.

Referring to the drawings in detail, a receptacle designated generally 10 comprises a hollow cylindrical body 12 carrying adjacent one side a handle 14. The body 12 is lined with a suitable thermal insulation 16 and extending into the body through the open top thereof is a receptacle defining a secondary expansion chamber 18. The receptacle defining the secondary expansion chamber 18 contains a cooling coil 24 comprising longitudinally spaced convolutions of tubing, the uppermost of which communicates through a port 20 with the interior of the secondary expansion chamber 18 adjacent the upper end thereof. The lower end of the chamber 18 is vented as at 26 to atmosphere. Carried by the lowermost convolution of the coil 24 and extending radially therefrom and through the expansion chamber 18 is a nipple 28. Extending transversely across the body 12 adjacent the lower end thereof is a cartridge chamber 30, the underside of which opens downwardly and is closed by a hinged cover 32 which carries a bolt 34 that enters a skirt 36 carried by and extending downwardly from the bottom of the receptacle 10. Extending into the receptacle 10 and communicating with the cartridge chamber 30 adjacent one end thereof is a recess 35 which communicates through a passage 36 with a duct 38 that in turn communicates with the nipple 28 so as to establish communication between the cartridge chamber 30 and the expansion chamber 18. A valve 40 is carried by the body 12 and extends through the duct 38 for a purpose to be more fully hereinafter described. Seated in the recess 35 is a gasket 42 which is adapted to engage the neck 44 of a puncturable refrigerant containing cartridge 46, and carried by the body 12 and extending into the passage 36 is a needle 48 having a passage 50 extending therethrough which communicates with the passage 36 at its junction with the duct 38. Extending through the body 12 in axial alignment with the passage 36 is an internally screw threaded opening 52 in which is threadedly received a pressure plug 54 carrying wings 56 by which the plug may be turned to cause it to advance into contact with the cartridge 46, and move it in a rectilinear path through the cartridge chamber 30 and into contact with the needle 50 to puncture the cartridge and permit the contents thereof to flow through the duct 38 into the expansion chamber 18, to cool the contents thereof. In the preferred form of the invention, a cover 58 is hingedly connected as at 60 to the body 12 to close the upper open end of the receptacle 10.

In the modified form of the invention illustrated in Figures 6 and 7, a receptacle designated generally 62 comprises a hollow circular cylindrical body 64 having an open top which is closed by a removable cover 66. Carried by the body 64 and extending laterally outwardly therefrom are arms 68 and 70 which are joined adjacent their ends remote from the body 64 by a handle 72. Extending into the handle 72 through the top thereof is a bore 74 defining a cartridge chamber having an open upper end and hingedly coupled as at 76 to the arm 70 adjacent its junction with the body 64 is a cover 78 having an internally screw threaded opening 80 extending therethrough in which is threadedly received a plug 82 carrying outwardly extending wings 84 by means of which the plug may be turned in the threaded opening to advance the inner end of said plug into the bore 74 defining the cartridge chamber. A set screw 86 is carried by the handle 72 and extends into the bore 74 adjacent the upper end thereof for engaging the cover 78 and locking it in closed position with relation to the cartridge chamber. Extending through the arm 68 is a duct 88 which communicates at one end with a nipple 90 carried by an expansion chamber designated generally 92 which comprises

inner and outer concentric walls 94 and 96 between which is disposed in spaced concentric relation a partition wall 98 which separates the expansion chamber into inner and outer compartments 100 and 102. The nipple 90 communicates with the interior of the compartment 100, as will be readily understood upon reference to the drawings, while the compartment 102 communicates with atmosphere through a nipple 104 and extending through the partition wall 98 adjacent the upper end thereof is an opening 106 so that refrigerant entering the nipple 90 through the duct 88 will pass into the inner compartment 100 and thence through the passage 106 to the outer compartment 102 to be vented to atmosphere through the opening 104.

A recess 108 opens into the bore defining the cartridge chamber 74 adjacent the lower end thereof and communicates through a passage 110 with the duct 88, and seated in said recess 108 is a gasket 112 in which is received the reduced neck 114 of a puncturable refrigerant containing cartridge 116. A needle 118 extends through the lower end of the handle 72 and the junction of the passage 110 with the duct 88 and into the recess 108, so that when the cartridge 116 is advanced by turning the plug 82 in its rectilinear path and contacts with the needle, the cartridge will be punctured to permit the contents thereof to pass through the needle and into the duct 88 through the passage 110. A suitable valve 120 is carried by the arm 68 and intersects the duct 88 to regulate the flow of the refrigerant through said duct and into the expansion chamber. In the preferred form of the invention, the duct 88 is provided with a constriction 122 adjacent its junction with the passage 110, as will be readily seen upon reference to Figure 7.

In the further modification illustrated in Figures 3 through 10, inclusive, the receptacle designated generally 124 comprises a hollow cylindrical body 126 having an open top which is closed by a cover 128. An expansion chamber designated generally 130 lines the interior of the body 126 and comprises inner and outer walls 132 and 134 arranged in spaced concentric relation and carried by the outer wall 134 and extending through the body 126 is a nipple 136 defining a vent, the purpose of which will hereinafter appear. Secured to the inner wall 132 are longitudinally spaced convolutions 138 of a tubular coil, the upper end of which communicates through a port 140 with the space 142 between the inner and outer walls 132 and 134. Carried by the lowermost convolution of the tubular coil 138 and extending outwardly through the inner and outer walls 132 and 134 adjacent the bottom of the receptacle 124 is a nipple 144, the purpose of which will hereinafter appear.

Carried by the body 126 and extending radially outwardly therefrom adjacent the upper end thereof is an arm 146 and a similar arm 148 projects radially outwardly from the body 126 adjacent the lower end thereof. A handle 150 is carried by and extends between the arms 146 and 148 remote from the body 126 and this handle is provided with a bore 152 which extends through the top thereof and defines a cartridge chamber. A cover 154 is hingedly connected to the arm 146 adjacent the body 126 as at 156 and extending through said cover for communication with the cartridge chamber and in axial alignment therewith when the cover is closed is an internally screw threaded opening 158. An externally screw threaded plug 160 is threadedly engaged in the opening 158 and carries wings 162 by means of which the plug 160 may be turned to advance or retract it. The lower end of the plug projects into the cartridge chamber for engaging a puncturable refrigerant containing cartridge 164 which is mounted in the cartridge chamber 152 for movement longitudinally therein in a rectilinear path. Extending into the lower end of the handle 150 and communicating with the cartridge chamber 152 is a recess 166 in which is seated a gasket 168 which is adapted to engage the neck 170 of the cartridge 164 in order to establish a fluid-tight

junction between the cartridge and the recess 166. Extending into the handle and communicating with the recess 166 is a passage 172 which communicates with a duct 174 which extends through the arm 148 and communicates with the nipple 144 of the expansion chamber 130. A needle 176 is carried by the arm 148 and extends into the passage 172 adjacent its junction with the duct 174 for piercing the puncturable refrigerant containing cartridge 164 and allowing the contents thereof to enter the expansion chamber 130 through the duct 174 and nipple 144. A suitable control valve 178 is carried by the arm 148 and intersects the duct 174 to regulate the flow of refrigerant therethrough. Like the structure illustrated in Figure 7, the duct 174 is provided adjacent its junction with the passage 172 with a constriction 180. A set screw 182 is carried by the handle 150 and is adapted to engage the cover 154 to hold it closed and the plug 160 in axial alignment with the cartridge chamber 152.

In use, it will be evident that when employing the device illustrated in Figures 1 through 5, inclusive, the puncturable cartridge 46 containing refrigerant is deposited in the cartridge chamber 30 through the bottom thereof after which the cover 32 is closed and bolted into place, as illustrated in Figure 2, it being understood that the plug 54 has been turned to cause it to retract and allow room for the insertion of the cartridge. With the cartridge in place, it will be evident that when it is desired to refrigerate the contents of the receptacle 10, the plug 54 is turned to advance the cartridge into contact with the needle 50 which punctures the cartridge and permits the contents thereof to flow through the passage 36 and duct 38 into the expansion chamber 18. The rapidity with which the refrigerant enters the expansion chamber 18 may be regulated by the valve 40 and as the refrigerant expands in the expansion chamber 18, a cooling of the contents thereof will be effected. Upon expansion of the refrigerant, it is permitted to escape through the vent 26 to atmosphere. Obviously, as the cartridge 46 is advanced into engagement with the needle 50, the neck 44 thereof will be firmly pressed into engagement with the gasket 42 to effect a fluid-tight junction between the cartridge and the wall of the recess 34.

In employing the modified forms of the invention, illustrated in Figures 6 through 10, inclusive, the cartridge 116 or 164, as the case may be, is advanced in its respective cartridge chamber into contact with its respective needle and escape of the contents of the punctured cartridge around the neck thereof is prevented by the gasket 112 or 168, as the case may be. Passing through the duct, and control valve, the refrigerant will enter the expansion chamber of its respective receptacle through which the refrigerant passes and expands to refrigerate the contents of the receptacle. The refrigerant eventually will find its way through the vent which is connected to the expansion chamber and be vented to atmosphere.

While in the foregoing there has been shown and described the preferred embodiment of this invention, it is to be understood that minor changes in the details of construction, combination and arrangement of parts may be resorted to without departing from the spirit and scope of the invention as claimed.

What is claimed is:

1. A pocket liquid cooling device comprising a receptacle having an open top, an expansion chamber lining the interior of the receptacle, a handle carried by the receptacle and extending parallel therewith adjacent one side thereof; said handle having a cartridge chamber extending thereinto through the top thereof which cartridge chamber communicates with the expansion chamber, a puncturable refrigerant containing cartridge mounted in the cartridge chamber for movement in a longitudinal path therein, and a needle mounted in the handle and extending into the path of movement of the cartridge for puncturing said cartridge when the cartridge is advanced

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in its longitudinal path and releasing refrigerant contained in the cartridge for delivery into the expansion chamber.

2. A pocket liquid cooling device comprising a receptacle having an open top, an expansion chamber lining the interior of the receptacle, a handle carried by the receptacle and extending parallel therewith adjacent one side thereof, said handle having a cartridge chamber extending thereinto through the top thereof which cartridge chamber communicates with the expansion chamber, a puncturable refrigerant containing cartridge mounted in the cartridge chamber for movement in a longitudinal path therein, a needle mounted in the handle and extending into the path of movement of the cartridge for puncturing said cartridge when the cartridge is advanced in its longitudinal path and releasing refrigerant contained in the cartridge for delivery into the expansion chamber, and means carried by the handle and extending into the cartridge chamber for engaging the cartridge and advancing it toward the needle.

3. A pocket liquid cooling device comprising a receptacle having an open top, an expansion chamber lining the interior of the receptacle, a handle carried by the receptacle and extending parallel therewith adjacent one side thereof, said handle having a cartridge chamber extending thereinto through the top thereof which cartridge chamber communicates with the expansion chamber, a puncturable refrigerant containing cartridge mounted in the cartridge chamber for movement in a longitudinal path therein, a needle mounted in the handle and extending into the path of movement of the cartridge for puncturing said cartridge when the cartridge is advanced in its longitudinal path and releasing refrigerant contained in the cartridge for delivery into the expansion chamber, a cover carried by the handle for closing the cartridge chamber, and means carried by the cover and extending into the cartridge chamber for engaging the cartridge and advancing it toward the needle.

4. A pocket liquid cooling device comprising a receptacle having an open top, an expansion chamber lining the interior of the receptacle, a handle carried by the receptacle and extending parallel therewith adjacent one side thereof, said handle having a cartridge chamber extending

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thereinto through the top thereof, said handle having a duct therein which establishes communication between the cartridge chamber and the expansion chamber, a needle carried by the handle and extending into the cartridge chamber adjacent its junction with the duct, a puncturable refrigerant containing cartridge mounted in the cartridge chamber for movement longitudinally therein and advance toward the needle, a cover pivoted to the receptacle for closing the open upper end of the cartridge chamber, and means carried by the cover and extending into the cartridge chamber for engaging the cartridge and advancing it toward the needle to puncture said cartridge and deliver the contents thereof through the duct and into the expansion chamber.

5. A pocket liquid cooling device comprising a receptacle having an open top, an expansion chamber lining the interior of the receptacle, a handle carried by the receptacle and extending parallel therewith adjacent one side thereof, said handle having a cartridge chamber extending thereinto through the top thereof, said handle having a duct therein which establishes communication between the cartridge chamber and the expansion chamber, a needle carried by the handle and extending into the cartridge chamber adjacent its junction with the duct, a puncturable refrigerant containing cartridge mounted in the cartridge chamber for movement longitudinally therein and advance toward the needle, a cover pivoted to the receptacle for closing the open upper end of the cartridge chamber, means carried by the cover and extending into the cartridge chamber for engaging the cartridge and advancing it toward the needle to puncture said cartridge and deliver the contents thereof through the duct and into the expansion chamber, and a valve in the duct for regulating the passage of refrigerant therethrough.

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